

REMARKS

Claims 1-7, 9-11, and 13-19 are pending and stand rejected.

Claims 1-5, 7, 9-11 and 13-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the document Sensors and Actuators by Martin et al. (“the Martin reference”) in view of United States Patent No. 4,922,745 to Rudkin et al. (“the Rudkin reference”), United States Patent No. 5,337,605 to Schultz et al. (“the Schultz reference”), and United States Patent No. 6,479,763 to Igaki et al. (“the Igaki reference”). Applicants respectfully submit that the rejection should be withdrawn in view of the following explanation.

According to the Examiner, the Martin reference discloses an optically polished AT-cut quartz wafer onto which a smooth resonator, a textured resonator, and a resistance temperature device are formed. This quartz wafer is depicted as being integrally attached to two RF connectors. The Examiner asserts that the quartz wafer forms a base, which may be considered a bottom. In addition, the “Examiner does not consider that Martin discloses a container.” (8/4/04 Office Action, p. 2). However, the Examiner further asserts that because the quartz wafer is immersed in liquid during a measurement of the liquid, the Examiner considers this to be “equivalent to an immersible container being immersed in the liquid during a measurement.” (8/4/04 Office Action, p. 3). Applicants respectfully submit that the Examiner’s conclusion is legally and factually incorrect, as explained below.

Initially, Applicants note that the Examiner bears the initial burden of presenting a prima facie case of obviousness, which requires that the prior references teach or suggest all of the claimed limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Claim 1 recites, in relevant parts, “an immersible container having a cap, a bottom, an enclosed piezoelectric sensor device, and at least one of a liquid inlet and liquid outlet.” To the extent the Examiner concedes that Martin does not disclose a container, the Martin reference cannot be construed as disclosing or teaching the claimed *structural limitation* of “an immersible container having a cap, a bottom, an enclosed piezoelectric sensor device, and at least one of a liquid inlet and liquid outlet,” regardless of whether the quartz wafer of Martin being immersed in liquid during a measurement of the liquid is indeed “equivalent to an immersible container being immersed in the liquid during a measurement.” While the Examiner focuses on the *functional equivalence*, it is not permissible to simply ignore the fact that the claimed *structural limitation* is not disclosed or suggested in the applied prior art.

Independent of the above, Applicants respectfully note that immersion of the quartz wafer of Martin simply cannot be equivalent to immersing in the liquid “an immersible container having a cap, a bottom, an enclosed piezoelectric sensor device, and at least one of a liquid inlet and liquid outlet.” The quartz wafer disclosed in the Martin reference does not enclose a piezoelectric sensor, nor is there any suggestion of using an enclosing container. As described in the Martin reference, a smooth resonator, a textured resonator, and a resistive temperature device are formed onto the quartz wafer. Thus, the quartz wafer does not enclose a piezoelectric sensor, and there is no suggestion of using an enclosing container.

Additionally, as acknowledged by the Examiner, the quartz wafer of Martin does not have a cap or at least one of a liquid inlet and liquid outlet. The Examiner cites the Rudkin reference as disclosing a shroud, and the Examiner asserts that “[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to include a shroud with fluid ingress (inlet) and egress (outlet) in order to offer protection which ‘may be important where foreign bodies within a metered fluid are likely to impact.’” (Office Action, August 4, 2004, p. 4). The only motivation the Examiner has provided for modifying the Martin reference to include the Rudkin shroud is that it “*may be important* where foreign bodies within a metered fluid are likely to impact.” However, there is no indication or suggestion in the Martin reference that foreign bodies are present during use of the monolithic sensor, or that such foreign bodies (if present) would impact the sensor. Applicants respectfully submit that the Examiner is speculating without any concrete prior art reference support.

Furthermore, the Rudkin reference does not teach or disclose the use of the shroud as protecting the sensor from foreign bodies. The Rudkin reference states:

Before the transducer of the embodiment described can be successfully used operationally, calibration will be required. Production transducers will normally be calibrated in at least on known liquid and in a sufficient volume thereof for substantially unbounded conditions to apply. In use, however, boundaries and barriers proximate the fork structure may be unavoidable, and the calibration will be invalid, since surfaces in the metered fluid near the transducer effectively increase the fluid added mass.

A transducer with an alternative form of shroud provides a solution to the problem. (Rudkin, col. 3., ll. 34 – 45).

According to the Rudkin reference, the purpose of the shroud is to alleviate a problem of increasing the fluid added mass when the fork structures of the transducer are proximate to boundaries and barriers. The shroud is not provided for affording the protection to the sensor against foreign bodies. In fact, the piezoelectric sensors in the sensor depicted in the Rudkin reference are housed in one or more cavities within the tines. Thus, the piezoelectric sensor

material is not exposed or immersed in the liquid during a measurement of the liquid, and the shroud does not offer any protection to the piezoelectric material.

Thus, the Martin reference fails to disclose, teach, or suggest any need to offer protection against foreign bodies coming into contact with the piezoelectric material as suggested by the Examiner as the reason to add the Rudkin shroud. Further, the Rudkin reference fails to disclose, teach, or suggest using a shroud for protecting the piezoelectric sensors against such foreign bodies. Therefore, there is no suggestion or motivation to modify the Martin reference with the shroud disclosed in the Rudkin reference, in contrast to the assertion made by the Examiner.

Additionally, as acknowledged by the Examiner, the Martin reference does not disclose or teach conductive adhesive containing metal coupling electric lead conductors to the electric contact points. The Examiner asserts that “[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to use metal filled adhesive potting to join the leads and pads as it advantageously ‘prevents corrosion or degradation of the connection’ from moisture which would be a problem for a sensor immersed in liquid.” (Office Action, August 4, 2004, p. 5). The Martin reference discloses a sensor having gold electrodes, (Martin, p. 215), and there is no suggestion that the gold electrodes are prone to corrosion or degradation due to moisture from the liquid being measured. Since there is no indication that there is a corrosion problem with the gold electrodes in the Martin reference, there is no suggestion or motivation to modify the Martin reference with the Schultz and the Igaki references.

Since there is no motivation to combine the teachings of the Martin, Rudkin, Schultz and Igaki references to arrive at the invention recited in Claim 1, these applied references do not render Claim 1 or its dependent Claims 2-5, 7, 9-11, and 13-19 obvious under 35 U.S.C. §103(a). It is therefore respectfully requested that this rejection be withdrawn.

Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over the Martin reference as modified by the Rudkin, Schultz, and Igaki references, and further in view of Japanese Patent No. 06347339A to Kitsuta (“the Kitsuta reference”).

As described above, the Martin, Rudkin, Schultz and Igaki references do not render obvious Claim 1. The Kitsuta reference does not overcome this deficiency of the Martin, Rudkin, Schultz and Igaki references as applied against claim 1. Since Claim 6 depends from Claim 1, the Martin, Rudkin, Schultz, Igaki, and Kitsuta references similarly do not render Claim 6 obvious under 35 U.S.C. §103(a). It is therefore respectfully requested that this rejection be withdrawn.

CONCLUSION

In light of the foregoing, Applicants respectfully submit that all of the pending claims 1-7, 9-11 and 13-19 are in condition for allowance. Prompt allowance of the present application is therefore earnestly solicited.

Respectfully Submitted,

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